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Suppliers' Information Note

For The BT Network

BT KiloStream Aggregate Interface

Service Description

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1. Introduction

This Suppliers Information Note (SIN) describes the "KiloStream Aggregate Interface" service using a 2.048Mbit/s ITU-T G.703[1] interface. This SIN provides information about this service for terminal equipment manufacturers and developers.

Note: The following speed options were withdrawn from new supply in November 2012 - 192kbit/s, 320kbit/s, 384kbit/s, 448kbit/s, 576kbit/s, 640kbit/s, 704kbit/s, 768kbit/s, 832kbit/s, 896kbit/s and 960kbit/s.

All remaining speed options – 128kbit/s, 256kbit/s and 512kbit/s were withdrawn from new supply in September 2016. All KiloStream N products (i.e. all speeds) were then withdrawn from service completely at the end of March 2020. Reasonable endeavours maintenance support will continue to be provided on existing installations contracted under Emergency Overrun Service extension (EOS extension) terms and conditions, and where technically possible and commercially realistic to do so until circuits are either ceased or withdrawn from the EOS service limited extension completely at the end of July 2026.

2. Service Outline

The "KiloStream Aggregate Interface" service allows for multiple numbers of inland KiloStream 64kbit/s circuits, possibly from all over the United Kingdom, to be delivered to a site as a single 2048kbit/s customer presentation.

Note: The following speed options were withdrawn from new supply in November 2012 - 192kbit/s, 320kbit/s, 384kbit/s, 448kbit/s, 576kbit/s, 640kbit/s, 704kbit/s, 768kbit/s, 832kbit/s, 896kbit/s and 960kbit/s.

All remaining speed options – 128kbit/s, 256kbit/s and 512kbit/s were withdrawn from new supply in September 2016. All KiloStream N products (i.e. all speeds) were then withdrawn from service completely at the end of March 2020. Reasonable endeavours maintenance support will continue to be provided on existing installations contracted under Emergency Overrun Service extension (EOS extension) terms and conditions, and where technically possible and commercially realistic to do so until circuits are either ceased or withdrawn from the EOS service limited extension completely at the end of July 2026.

The service does this by supporting the transmission of synchronous serial data at rates of 64kbit/s via the G.703 interface using the G.704[2] frame structure. The service will support a maximum Customer usable bandwidth of 31 individual 64kbit/s circuits (with a minimum of 15 individual 64kbit/s circuits) per Aggregate Interface.

The service will support:

- Aggregate to Single 64kbit/s X.21[3],
- Aggregate to n x 64kbit/s (X.21 & G.703),

- Aggregate to Aggregate,

The characteristics of the non-aggregate end interfaces can be found in:

- SIN 57[4] 'KiloStream X.21 Interface – Service Description'.
- SIN.158[5] 'KiloStream n x 64kbit/s – Service Description'

3. Service Availability

Note: The following speed options were withdrawn from new supply in November 2012 - 192kbit/s, 320kbit/s, 384kbit/s, 448kbit/s, 576kbit/s, 640kbit/s, 704kbit/s, 768kbit/s, 832kbit/s, 896kbit/s and 960kbit/s.

All remaining speed options – 128kbit/s, 256kbit/s and 512kbit/s were withdrawn from new supply in September 2016 All KiloStream N products (i.e. all speeds) were then withdrawn from service completely at the end of March 2020. Reasonable endeavours maintenance support will continue to be provided on existing installations contracted under Emergency Overrun Service extension (EOS extension) terms and conditions, and where technically possible and commercially realistic to do so until circuits are either ceased or withdrawn from the EOS service limited extension completely at the end of July 2026 .

The "KiloStream Aggregate Interface" service, implementing the G.703 75 ohm unbalanced interface, was launched on the 30th June 1995 throughout the UK (inland only).

The "KiloStream Aggregate Interface" service, implementing the G.703 120 ohm balanced interface, was launched on the 1st January 1997 throughout the UK (inland only).

Support of "n x 64kbit/s" via a "KiloStream Aggregate Interface" was introduced on the 22nd October 1996 throughout the UK (inland only).

4. Technical Specification

4.1 The G.703 Interface

4.1.1 Physical

4.1.1.1 Implementing the G.703 75 ohm Unbalanced Interface

Physically, the digital presentation of the G.703[1] service is via a pair of BNC unbalanced 75Ω sockets, one for each direction of transmission. The sockets conform to the general requirements of IEC 169-8[6] with the mating dimensions specified in annex B of BS ISO/IEC 10173 : 1991[7].

4.1.1.2 Implementing the G.703 120 ohm Balanced Interface

Physically, the digital presentation of the G.703 service is a 120 Ohm balanced interface via a socket which conforms to BS EN 60603-7 : 1993[8] (RJ45 type). The pin out/contact assignment is given in the standard BS ISO/IEC 10173 : 1991[7].

4.1.2 Electrical

Electrically, this presentation conforms to G.703, Section 6. The line code is High Density Bipolar No.3 (HDB3) as defined in G.703, Annex A.

4.1.3 Frame Structure

The frame structure offered over the G.703 interface complies with G.704[2] Section 5.

Within the constraints of available capacity (up to 1984kbit/s) customers will be advised which timeslots (1 through 31) will be used to support a particular circuit.

4.1.4 Timing

The network will support customers transmit signal timing which is in accordance with the following:

- Be derived/extracted from the receive signal presented by the BT network as specified in BSI PD 7024: 1995: Clause 6.4[9].

4.2 Network Terminating Unit (NTU) Power Arrangements

The NTU requires a -50Volt power feed, and consumes 10Watts of power. This -50Volt supply can be supplied by BT, or a customer provided power supply can be used (See note). A customer supplied mains power source will be required close to the installation to operate the BT -50V power supply.

Where the NTU is powered by a customer provided -50Volts, the NTU will be supplied with a connection lead which will be presented as wires only. As power supplies can vary slightly in output voltage and characteristics, the NTU will function with customer provided power supplies which are in accordance with the British Telecom Network Requirement (BTNR) 2511[10].

Note. Customer provided power supplies for connection to this service shall conform with relevant safety standards.

5. KiloStream n x 64kbit/s implemented via an Aggregate Interface

This Section provides additional information relating to the "n x 64kbit/s (X.21 and G.703) service" when implemented via a "KiloStream Aggregate Interface". Reference should be made to SIN 158[5] "n x 64kbit/s (X.21 and G.703) - Service Description", the service is commonly known as KiloStream N (Voice & Data)

Note: The following speed options were withdrawn from new supply in November 2012 - 192kbit/s, 320kbit/s, 384kbit/s, 448kbit/s, 576kbit/s, 640kbit/s, 704kbit/s, 768kbit/s, 832kbit/s, 896kbit/s and 960kbit/s.

All remaining speed options – 128kbit/s, 256kbit/s and 512kbit/s were withdrawn from new supply in September 2016. All KiloStream N products (i.e. all speeds) were then withdrawn from service completely at the end of March 2020. Reasonable endeavours maintenance support will continue to be provided on existing installations contracted under Emergency Overrun Service extension (EOS extension) terms and conditions, and where technically possible and commercially realistic to do so until circuits are either ceased or withdrawn from the EOS service limited extension completely at the end of July 2026.

5.1 Service Variations

5.1.1 KiloStream N (Data) Service

The KiloStream N (Data) service, implemented via a KiloStream Aggregate Interface, is offered as an N only service, as opposed to N+1.

Network Terminating Units (NTUs) associated with the non-aggregate KiloStream N (Data) inland service generate an additional timeslot between each other to convey the interface conditions.

The service offered via the KiloStream Aggregate Interface (G.703[1]) cannot convey the circuit interface conditions Control & Indicate (C & I) across the network i.e. from A end customer premises to B end customer premises. The number of timeslots/channels taken up end to end shall therefore only be the N number required by the customer to support their application e.g. 128k (N=2). The C & I interface conditions may need to be held "high" by the customer locally for their terminal equipment to pass data. The distant (non-aggregate) end will be served via an NTU with an X.21[3] interface, although circuits can be provided with an aggregate delivery at both ends.

As with the non-aggregate KiloStream N (Data) service the maximum amount of bandwidth available to the customer is 1024kbit/s i.e. n = 16.

5.1.2 KiloStream N (Voice) Service

The options on KiloStream N (Voice) where the customer equipment timeslot zero (CTS0) is conveyed end to end over the circuit will not be available for a circuit delivered via a KiloStream Aggregate Interface (G.703).

Customer equipment will derive frame alignment either from the aggregate interface, for equipment at the aggregate end, or if at the non-aggregate end from the NTU where it will be generated locally.

The option of a customer requesting timeslot 16 (TS16), where inter-PBX working is generally the application, will still be valid. However, TS16 generated at the non-aggregate end will not appear in TS16 of the KiloStream Aggregate Interface frame format, instead it will appear within the timeslots of the aggregate allocated to the KiloStream N (Voice) circuit block. The customer terminal equipment will need to manage the re-mapping of the timeslots into the required frame structure of the 'n' circuit. The distant (non-aggregate) end will be served via an NTU with a G.703 interface, although circuits can be provided with an aggregate delivery at both ends.

As with the current KiloStream N (Voice) service the maximum amount of bandwidth available to the customer is 1024kbit/s i.e. n = 16.

6. Service Maintenance

There are no mandatory maintenance facilities associated with this service. Optional maintenance facilities are described in Annex B.

7. Further Information

For "sales and marketing" information about this service please contact either:

- Your Company's BT account manager.
- For personal customers, BT sales on 0800 800150 for product and service information, sales and rental enquiries.
- For business customers, BT sales on 0800 800152 for product and service information, sales and rental enquiries.

If you have enquiries relating to this document then please contact: sinet.helpdesk@bt.com

8. Reference

[1]	ITU-T Recommendation G.703 - Physical/Electrical Characteristics of Hierarchical Digital Interfaces.
[2]	ITU-T Recommendation G.704 - Synchronous Frame Structures used at 1544, 6312, 2048, 8488 and 44 736 kbit/s Hierarchical Levels.
[3]	ITU-T Recommendation X.21 - Interface between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) for Synchronous Operation on Public Data Networks.
[4]	SIN 57 – 'BT KiloStream X.21 Service Description'.
[5]	SIN 158 – 'BT KiloStream n x 64kbit/s Service Description'.
[6]	British Standard IEC 169-8 - Radio-frequency connectors - Part 8 : R.F. coaxial connectors with inner diameter of outer conductor 6.5 mm (0.256 in) with bayonet lock - Characteristic impedance 50 ohms (Type BNC).
[7]	British Standard BS ISO/IEC 10173 - Integrated Services Digital Network (ISDN) Primary Access Connector at Reference Points S and T.
[8]	British Standard BS EN 60603-7 - Connectors for frequencies below 3 MHz for use with printed boards - Part 7. Detail specification for connectors, 8-way, including fixed and free connectors with common mating features.
[9]	British Standard PD 7024 - Essential requirements for terminal equipment intended for connection to unstructured digital leased circuits of the public telecommunications network using a CCITT G.703 interface at a rate of 2048kbit/s with a 75Ω unbalanced presentation.
[10]	BTNR 2511 - Interface of telecomms equipment with a nominal 48v negative dc power supply.
[11]	ITU-T Recommendation G.706 - Frame alignment and Cyclic Redundancy Check (CRC) procedures relating to basic frame structures defined in recommendation G.704.
[12]	ITU-T Recommendation G.732 - Characteristics of primary PCM multiplex equipment operating at 2048kbit/s.

9. Glossary

BTNR	British Telecommunications Network Requirements
C & I	Control and Indicate
CCITT	The International Telegraph and Telephony Consultative Committee (Former name of ITU-T)
CRC	Cyclic Redundancy Check
CTS	Customer Timeslot
DCE	Data Circuit Terminating Equipment
DTE	Data terminal Equipment
HDB3	High Density Bipolar N°3
ISO	International Standards Organisation
ITU-T	International Telecommunications Union for Telecommunications (formerly CCITT)
NTU	Network Terminating Unit; BT's designation of the device performing the functions of a Data Circuit Terminating Equipment (DCE)
PCM	Pulse Code Modulation
SIN	Suppliers Information Note
TS	Timeslot

10. History

Issue 1	January 1996	First Issued.
Issue 2	February 1997	Updated to included a G.703 120 ohm balanced interface.
Issue 2.1	April 2001	Editorial changes and new format.
Issue 2.2	January 2003	Merge of content from SIN 268 – 'n x 64kbit/s via an Aggregate Interface'.
Issue 2.3	February 2004	Approval Requirements statement removed, information available via SINet Useful Contacts page. Section and reference numbering amended.
Issue 2.4	November 2012	Note added about the withdrawal of some speeds from new supply (from end of November 2012)
Issue 2.5	February 2015	Note added to provide advance notification of withdrawal from new supply of remaining speeds and interfaces.
Issue 2.6	January 2016	Notes updated to provide advance notification of expected service final withdrawal timeframes. Change SINet site references from http://www.sinet.bt.com to http://www.btplc.com/sinet/
2.7	|May 2018	Editorial changes to notes on withdrawal timeframes.
2.8	September 2020	Additional minor phrasing changes in availability text. Change SINet site references from http://www.btplc.com/sinet/ to https://www.bt.com/about/sinet
2.9	September 2023	Minor editorial changes to the note on withdrawal. Reasonable endaeavours maintenance on Emergency Overrun Service extension until end of March 2024. BT registered address changed to One Braham

2.10	September 2024	Minor editorial changes as EoS extension has a further limited extension until end of March 2025
2.11	February 2026	Minor editorial changes as EoS extension has a further limited extension until end of July 2026

-END-

ANNEX A - Data Structuring

A.1 INTRODUCTION

The information in this annex is offered without prejudice to assist terminal equipment manufacturers in the specification of appropriate equipment.

A.1.1 Timeslot Zero

Timeslot zero will not be available to support any customer application. The utilisation of nominally spare bits will be as follows:

A.1.1.1 Terminal Equipment to the Network

Bit 1 of the 'frame alignment signal' and 'not frame alignment signal' should comply with one of the following:

- Fixed at binary 1
- Provide a cyclic redundancy check facility in accordance with G.704 Paragraph 2.3.3[2] and G.706 Paragraph 4[11]. The CRC facility will not be extended beyond the NTU into the network.

Bits 4 to 8 of the 'not frame alignment signal' should be fixed at binary 1.

A.1.1.2 Network to the Terminal Equipment

Bits 4 to 8 of the 'not frame alignment signal' will be fixed at binary 1.

Bit 3 of the 'not frame alignment signal' provides a remote alarm indication. This bit will be set (active high) and extended to the customer equipment in the event that the network receives either of the following conditions within the signal from the customer equipment:

(i) 'Loss of incoming signal' (G.732[12])

(ii) 'Alarm Indication Signal' (G.732)

(iii) 'High bit error rate' (G.732)

ANNEX B - Maintenance Facilities.

The service incorporates a loop back capability at the G.703[1] interface (at the 2.048 Mbit/s level). This facility is provided to enable BT to fulfil its national maintenance obligations and to enable the location of potential faults between network and customer equipment. However, it is acknowledged that invoking the network loop back facility with this service (supporting multiple individual national private circuits within the common 2.048 Mbit/s connection) can cause disruption of customers' traffic. Equipment suppliers may find it advantageous to explore and specify options that may be available to enable the looping of individual circuits. This would enable other circuits to operate normally whilst initial provision or maintenance activities are undertaken.

End of Annexes